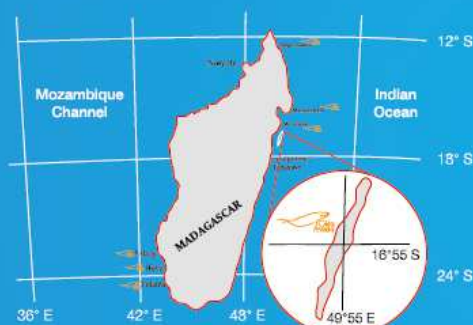


ABSTRACT

Quality control of the 3 first years of opportunistic observations from a whale-watching platform: boat-based, coordinated by a Malagasy NGO (CetaMada, founded in 2009) is presented. In 2009 a total of 12 boats were members, 14 boats in 2010 and 18 boats in 2011. Out of those member boats 6, 13 and 11 respectively collected data in collaboration with CetaMada. Vessels work between 14 to 8 weeks during the humpback whale (*Megaptera novaeangliae*) season (June to September) with a total of 20 to 35 trained volunteers per season. This network assures the respect of the local and international method of approach and responsible whale-watching. Standard boat based surveys are used to collect information on behaviour and to improve the photo identification database. About half of the associated boats collect scientific data, which is then centralized after the end of each season. For first time an automatic extraction of the data from the Excel files from 2009, 2010 and 2011 was used. Due to modifications of the original formats in Excel, by user, 26% to 30% of the data could not be recovered in the automatic way. Once the data was extracted, mistakes were categorized from 1 to 5, including wrong/absent data, observation time not recorded or incoherent and/or the trajectory of the individual was not coherent, GPS points and/or type of group not recorded. A preliminary GIS associated with the filtered data from Ste Marie during 2009-2010-2011 was developed. In 2009, 2 053 humpback whales' sightings were registered and 120 Photo IDs were usable, within more than 630 hours of effort, 16,6% of the extracted data had errors. In 2010 a total of 326 hours of surveys and 2009 sightings were registered, 16,4% of the data was not usable, 118 usable Photo-IDs were classified and published on line for free access (www.cetamada.org/data). In 2011, only files from June to August were considered for the QA/QC protocols. This season for the period referred register 692 hours of research, 2 748 sightings and a total of 176 usable flukes were partially processed (collection of data still in process), 17,2% of the extracted data was not exploitable. After analyzing the disadvantages and problems due to the collect of data in Excel files and the lost of effort and time for the analysis of the seasons, a prospect database was design. The database: CETA.NET, aims to minimize the errors in the data transcript and to maximize the access to results in real-time basis accessible to users.

OBJECTIVES AND LOCALIZATION:

1. To centralize the data collected by whale-watching and dolphin-watching operators around Madagascar's coast (Ste Marie, Toliara, Maroantsetra, Nosy Be, Diego-Suarez, Tamatave) in a systematic electronic format.
2. Analyze in real time the cetacean's population trends and habitat preferences, in the major costal areas of Madagascar.
3. To set up an "all-users-platform" to monitor cetacean's population in Madagascar.
4. To develop a scientific & community-based marine mammals monitoring system, accessible in real time.
5. To provide a marine mammal stranding online support and real-time recording platform for stranding events around the coastal areas of Madagascar.
- 6.- To be a reference system for integrated management of marine mammals, for the competent authorities in Madagascar (ministry of Environment, Tourism, Culture, etc.) and for international committees, such as the IOC, IWC and IUCN.



METHODS:

1. Boat-based observations:
 - id species (predominant specie: *Megaptera novaeangliae*)
 - geo-localization (beginning and end of contact for each group)
 - group composition (solitary, pair, mother and calf, etc)
 - behaviour (breach, spy hopping, etc)
 - photo ID (fluke, right dorsal, left dorsal, skin abnormalities)
 - acoustics (presence of singers)
 Platforms: whale-watching vessels, opportunistic flights, direct encounters (community-based), including stranding, and/or scientific missions (scientific community). Sites and year to test the protocol: Sainte Marie June to August 2011.
2. Excel files were used to collect data from each operator / platform.
3. Information was extracted from Excel filled files. Some data could not be recovered from the original Excel files. The common issue was the changes in the format of the original files by the seasonal users.
4. Five (5) types of errors were identify:
 - Type 1: absent at least one GPS point (beginning of contact and/or end of contact)
 - Type 2: GPS point outside the study area,
 - Type 3: wrong entry for the time,
 - Type 4: impossible trajectory,
 - Type 5: distance of the trajectory not feasible.
5. Data with no error was depurated and used for the GIS.

To minimize errors a database was design: CETA.NET, errors will be detected before users can validate the data



RESULTS:

TABLE I

YEAR	2009	2010	2011(*)
Total humpback whales (sightings)	1095	1284	2748
Effort of research (Hours)	680	790	692
Usable Photo IDs (flukes)	120	118	176

(*) partially processed data from season 2011 (June-August)

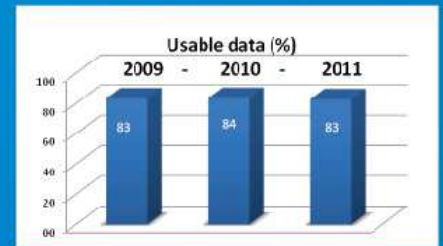
TABLE II

SEASON	2009	2010	2011
% of automatic extraction from original data	26,8	25,3	30,1 (*)

(*) partially processed data from season 2011 (June-August)

TABLE III

	2009	2010	2011
% error type 1	0	0,0	1,7
% error type 2	0	0,0	2,9
% error type 3	0	0,0	4,0
% error type 4	16,6	16,4	7,0
% error type 5	0	0,0	1,6
% not usable	16,6	16,4	17,2



CETA.NET

Community-based marine mammals monitoring online system in Madagascar



Distribution of Mothers and Calves' Groups August 2011



Monthly distributions per type of groups of humpback whales Ste Marie (2009-2011)



User login

- ✓ Validation in real time of data (QA/QC)
- ✓ Levels for entering data (basic, advanced)
- ✓ All marine mammals
- ✓ All sites in Madagascar
- ✓ All methods (scientific /opportunistic)
- ✓ Automatic results: preliminary, basic, advanced
- ✓ Crossed-references
- ✓ Database: .wav, .xls, .jpg
- ✓ Format of results: maps, tables, graphs



The system is based on the technology Margouill@TM, developed by the team Artists of CIRAD-Réunion (Laurent et al. 2011). The CETA.NET works with a Web server (Apache), a map server (MapServer), and a management system database with a spatial extension (PostgreSQL and PostGIS), under the Linux operating system.

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